UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/715,064	11/17/2003	Anand Pande	15156US01	7036

7590 03/13/2006	EXAMINER
CHRISTOPHER C. WINSLADE	TSAI, SHENG JEN

ART UNIT	PAPER NUMBER
2186	

CHRISTOPHER C. WINSLADE
MCANDREWS, HELD & MALLOY, LTD
500 WEST MADISON ST.
34TH FLOOR
CHICAGO, IL 60661

DATE MAILED: 03/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>31 January 2006</u>.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-10</u> is/are pending in the application.

    4a) Of the above claim(s) <u>1-6</u> is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>7-10</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

1.   This Office Action is taken in response to Applicants' Amendment and Remarks

filed on February 2, 2006 regarding application 10,715,064 filed on November 17, 2003.

2.   Claims 1-6 have been cancelled.

Claims 7-10 have been added.

Claims 7-10 are pending in the application under consideration.

3.   ***Response to Remarks and Amendments***

Applicants' amendments and remarks have been fully and carefully considered.

New claims 7-10 have been added. In response to the amendments, a new

ground of claim analysis, based on a newly identified reference (Shyi et al., US

5,426,756) has been embarked. Refer to the corresponding sections of claim analysis

for details.

Claim Rejections - 35 USC § 102

4.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5.   Claims 7-10 are rejected under 35 U.S.C. 102(b) as being anticipated by Shyi et

al. (US 5,426,756).

As to claim 7, Shyi et al. disclose **a circuit for storing data** [figures 7-9 show the

details of the circuit], **said circuit comprising**:

a FIFO for queuing the data [figure 1 shows the FIFO memory and FIFO control

block; a controller for asynchronous configurable FIFO memory includes, ... (abstract);

column 2, lines 26-68];

a read pointer for indicating a particular address in the FIFO [read pointer, figure 1,

20; RD/WR pointers figure 5, 46; RPTR, figure 7a, 46A; RPTR, figure 7b];

a write pointer for indicating another particular address in the FIFO [write pointer,

figure 1, 20; RD/WR pointers figure 5, 46; WPTR, figure 7a, 46A; WPTRM, figure 7b];

and

a comparator for determining whether the FIFO is empty or full [figure 5 shows the

empty (50) and full (48) signals indicating whether the FIFO is empty or full based on

Gray code counters (44)] **based on a comparison of a Gray code associated with**

the read pointer and a Gray code associated with the write pointer [figure 5 shows

the empty (50) and full (48) signals indicating whether the FIFO is empty or full based

on Gray code counters (44); figure 5, 42 shows the association of empty and full

signals with the RD/WR pointers; in addition to two binary counters for the read pointer

and write pointer, two Gray code counters for determining whether the FIFO is full or

empty by a comparison of the read pointer and write pointer values expressed in Gray

code. The Gray code counters avoid the problem of asynchronicity of read and write

signals. The Gray code counters determine if the FIFO is full or empty depending on

whether the pointer values match (indicating empty) or differ in accordance with

particular Gray code patterns (indicating full) (abstract)].

As to claim 8, Shyi et al. teach that **a first Gray code generator for generating the Gray code associated with the read pointer; and**

a second Gray code generator for generating the Gray code associated with the write pointer [figure 5 shows the empty (50) and full (48) signals indicating whether the FIFO is empty or full based on Gray code counters (44); figure 5, 42 shows the association of empty and full signals with the RD/WR pointers; in addition to two binary counters for the read pointer and write pointer, two Gray code counters for determining whether the FIFO is full or empty by a comparison of the read pointer and write pointer values expressed in Gray code. The Gray code counters avoid the problem of asynchronicity of read and write signals. The Gray code counters determine if the FIFO is full or empty depending on whether the pointer values match (indicating empty) or differ in accordance with particular Gray code patterns (indicating full) (abstract)].

As to claim 9, Shyi et al. teach that **a first Gray code to binary converter for generating the particular address indicated by the read pointer; and**

a second Gray code to binary converter for generating the another particular address indicated by the write pointer [figure 5, 42 shows the binary counters/converters for generating the address associated with the read and write pointer; in accordance with the invention, an asynchronous FIFO memory controller having four counters is provided for a configurable FIFO memory. Of the four counters, two are conventional binary counters for FIFO memory addressing (as used in the prior art FIFO memory controllers) and the other two are Gray code counters for determination of the full and empty conditions of the FIFO. The binary counters

conventionally maintain the read and write pointer values. The Gray code counters

directly determine if the FIFO is currently full or empty, rather than attempting to predict

if the next reading or writing of data will generate a full or empty signal as in the prior

art. Thus there is no need to use complicated logic to solve the asynchronicity problem

of FIG. 3. The Gray code counter in accordance with the invention has one more bit

than is necessary to count the actual number of memory locations, with the extra bit

being a carry bit to differentiate empty and full status (column 2, lines 26-46)].

As to claim 10, Shyi et al. teach that **the FIFO comprises a FIFO RAM** [figure 1

shows a FIFO memory; FIG. 1 shows a typical prior art asynchronous FIFO system.

Data is written into FIFO memory 10 ("FIFO") by write data path 12 and read out by

read data path 14 (column 1, lines 15-20)].

6.   *Related Prior Art Of Record*

The following list of prior art is considered to be pertinent to applicant's invention,

but not relied upon for claim analysis conducted above.

- Brooks et al., (US 5,410,664), "RAM Addressing Apparatus with Lower Power
  Consumption and Less Noise Generation."

- Cohn et al., (US 4,556,960), "Address Sequencer for Overwrite Avoidance."

- Jiang, (US Patent Application Publication 2004/0207547), "Method of Scalable
  Gray Coding."

- Pontius, (US 6,337,893), "Non-Power-Of-Two Gray-Code Counter System
  Having Binary Incrementer with Counts Distributed with Bilateral Symmetry."

- Yi, (US 6,703,950), "Gray Code Sequences."

Conclusion

7.   Claims 7-10 are rejected as explained above.

8.   **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later

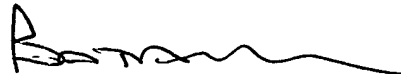than SIX MONTHS from the mailing date of this final action.

9.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Sheng-Jen Tsai whose telephone number is 571-272-

4244. The examiner can normally be reached on 8:30 - 5:00.

    If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Matthew Kim can be reached on 571-272-4182. The fax phone number for

the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

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you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).

                                Sheng-Jen Tsai
                                Examiner
                                Art Unit 2186

February 25, 2006

PIERRE BATAILLE
PRIMARY EXAMINER
3\2\06